

R E M A R K S

In the Office Action dated February 9, 2009, claims 1, 3-9 and 11-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Niederdrank in view of Shennib.

New claims 21-30 are submitted herein, that replace the aforementioned claims, and which are consistent with the arguments below in support of patentability over the teachings of Niederdrank and Shennib.

In the method and adjustment device of claims 21-30, a second hearing aid is adjusted based on a measured operating characteristic of a first hearing aid, the measured operating characteristic representing the overall operation of the first hearing aid between the audio input thereof and the audio output thereof. The purpose of making such an adjustment is allow quick and easy setting of a new hearing aid (the second hearing aid) for a hearing-impaired person in a manner corresponding to the current settings of the first hearing aid, which has been previously worn by the user, and which is to be replaced by the new hearing aid.

As explained in the introductory portion of the present specification, the setting of a hearing aid is highly subjective and several adjustments over time may be necessary until the hearing-impaired person who is using the hearing aid feels completely comfortable with the manner by which the hearing aid operates. When the hearing aid previously worn by a hearing-impaired person is to be replaced with a new hearing aid, it is usually desirable, even if it is known that the new hearing aid will ultimately be operated with settings that differ from the current settings used to operate the "old" hearing aid, to initially start adjustment of the new hearing aid by using the current settings of the old hearing aid. This is primarily because the

hearing-impaired person has become comfortable with those settings of the old hearing aid, and may find it difficult to begin using the new hearing aid with radically different settings.

In many situations, however, either the current settings of the old hearing aid are not precisely known, or it would be a laborious procedure to transfer those settings setting-by-setting to the new hearing aid.

In the method and adjustment device according to the present invention, those problems are overcome by placing the first hearing (old hearing aid) in a measurement device connected to a processor, and automatically determining, via the processor, an operational characteristic of the first hearing aid that represents the overall operation of the first hearing aid between the acoustic input thereof and the acoustic output thereof.

The operational characteristic, therefore, represents completely internal operation of the first hearing aid, and does not represent any type of measurement of the hearing environment in which the first hearing aid happens to be located.

The processor automatically analyzes the operational characteristic of the first hearing aid that has been obtained in this manner, and based on that analysis, automatically determines setting parameters for the second hearing aid. The second hearing aid is placed in communication with a setting device that is also operated by the processor, and the processor then automatically sets the second hearing aid with the settings that have been determined based on the operational characteristic of the first hearing aid.

Therefore, it is only necessary for a technician to place first hearing aid in the measurement device connected to the processor, and to place the second hearing aid in the setting unit that is also operated by the processor, and the second hearing aid is then set to operate easily and quickly with the same settings that were used to operate the first hearing aid. Laborious and time consuming measurement and/or individual setting is therefore avoided.

In one embodiment (claims 21 and 27) the setting parameters are simply read out from the memory of the first hearing aid and entered into a memory of the second hearing aid.

In another embodiment claims 22 and 28, acoustic signals are supplied to and detected from the first hearing aid, and from a ratio of these signals, the transfer function of the first hearing aid is determined, and the settings for the second hearing aid are then determined by analyzing this transfer function in the processor.

In further embodiments, the second hearing aid can then be further adjusted dependent on measurements made at the second hearing aid after it has been initially set with the aforementioned setting parameters.

As argued in Applicants' previous responses, the Niederdrank reference does not make any measurement whatsoever of the internal operating characteristics or settings of a particular hearing aid. The method and system disclosed in the Niederdrank reference are concerned with the fact that modern hearing aids are able to detect the hearing environment in which the hearing aid is currently or momentarily located, and to them modify or adjust the operating parameters of the hearing aid to match the current, detected audio environment. In binaural systems, wherein two hearing aids are employed, if both hearing aids operated to individually

detect the audio environment respectively for each hearing aid, it may occur, since the hearing aids are slightly separated by virtue of being worn in the two ears of a hearing-impaired person, that the two hearing aids would simultaneously detect slightly different audio environments, and each hearing aid would try to adjust the operating parameters thereof according to the audio environment detected by that particular hearing aid, and thus it may occur that the two hearing aids in a binaural system would compete with each other, or at least be incompatible with each other, by striving to operate according to these differently-detected audio environments.

The Niederdrank method and system solve this problem by using only one of the hearing aids in a binaural hearing aid system to detect the hearing or audio environment, and that hearing aid then sends information representing the detected audio environment to the other hearing aid in the binaural system. This ensures that both hearing aids will automatically set themselves according to the same detected audio environment.

Therefore, it is clearly not the case in the Niederdrank reference that there is an analysis of a first hearing aid *device* that produces an analysis result, nor is there a teaching to provide an input signal to the first hearing aid device and to analyze a corresponding output signal of the first hearing aid device, as characterized by the Examiner in the last paragraph at page 2 of the Office Action. The Niederdrank reference does *not* analyze the respective input signal and the respective output signal of one of the hearing aids in a binaural system in order to provide information to the other hearing aid in that system. Instead, as explicitly stated at column 4, lines 35-47 the hearing aid 1 has an analysis unit that identifies *acoustic field characteristics*. It is explicitly stated that these include signal levels, frequency

spectra, modulation frequencies, modulation depths, noise parts, spatial characteristics, etc. of the acoustic signals of the *acoustic field*. The “*acoustic field*” is the hearing environment, i.e., it is completely *external* to the hearing aid itself, and has nothing to do with the *internal* operation of the hearing aid. As explicitly stated at column 4, lines 45-47, it is these *acoustic field characteristics* that are identified and stored in a memory area 15A of a memory 15 of the hearing aid 1.

As further explicitly stated at column 4, lines 51-54, it is these stored *acoustic field characteristics* that are transmitted to the hearing aid 2, for use in the hearing aid 2.

Therefore, in the Niederdrank reference, for the purposes described above there is no determination, and thus no analysis, of anything that occurs *between* the acoustic input and the acoustic output of the first hearing aid that is then transmitted, as an analysis result to the second hearing aid in the binaural system. It is only the measurement of the *external* acoustic field characteristics that is done in the first hearing aid, and that is then transferred to the second hearing aid. These measured or detected acoustic field characteristics having nothing whatsoever to do with the internal operation of the first hearing aid itself, but only describe the *external* hearing environment in which both hearing aids in the binaural system are currently located.

The Examiner relied on the Shennib reference as, according to the Examiner, providing a disclosure to provide an input signal to the first hearing aid device and analyzing a corresponding output signal of the first hearing device to identify a transfer function that represents a ratio of the output sound signal to the input sound signal. The Examiner cited the Abstract of Shennib for that purpose. The Abstract of the Shennib reference, however, provides no such teaching, nor is there any such

teaching elsewhere in the Shennib disclosure. As discussed below, however, the Shennib disclosure does provide teachings that may be considered relevant to the subject matter of claims 21-30, but these teachings are in passages that were not cited at all by the Examiner.

In the Abstract of the Shennib reference, and throughout virtually the entirety of the specification thereof, extensive description is provided for determining the transfer function or transfer characteristic, of the ear canal, or the tympanic membrane, of the ear of a person who is being fitted with a hearing aid. This is thus quite similar to the teachings of the Niederdrank reference, wherein the external acoustic field characteristics are identified. The ear transfer characteristics have nothing whatsoever to do with a measurement or detection of the internal operating transfer function of a particular hearing aid and, like the acoustic field characteristics detected in Niederdrank, represent phenomena that exists exclusively externally of the hearing aid itself. Therefore, if this particular teaching of Shennib were used to modify in the Niederdrank reference, it would merely result in a binaural system wherein, instead of an analyzer in the hearing aid itself detecting the acoustic field characteristics, as in the Niederdrank disclosure, an external probe, as described in the Shennib reference would be used. Such a modified system, therefore, still would not result in the detection and use of an operating characteristic of an "old" hearing aid for the purpose of setting parameters in a "new" hearing aid that is intended to replace the "old" hearing aid, as set forth in independent claims 21 and 26.

The Shennib reference, in passages not cited by the Examiner, does, however, teach that the ICP (intra-canal prosthesis) can be generally designed to represent physical and electroacoustic characteristics of a desired type of hearing

aid (column 17, lines 65-67), but this statement includes the important exception that these characteristics *do not include* signal processing and signal generation. Thus the signals referred to at this location in the Shennib reference do not, and cannot represent the overall operation of a first hearing aid between the audio input thereof and the audio output thereof, because the signal processing circuitry in such a hearing aid is of course located between the audio input and the audio output, and such signal processing is explicitly accepted from the simulation described at this location in Shennib. In another embodiment of the Shennib reference, however, at column 19, lines 24-34, it is stated that remotely positioned speakers can deliver acoustic signals into the hearing aid microphone, and the ICP provides signals directly to the microphone 211 of the hearing aid 214. Additionally, in the paragraph bridging columns 24 and 25, the use of a transfer function that is referred to as the "total hearing aid transfer function", is described. This total hearing aid transfer function, however, is described in Shennib reference as being used in combination with the aforementioned external ear transfer function that is detected by the probe, in order to provide a model for use in setting that particular hearing aid. There is no teaching whatsoever in the Shennib reference to make use of the overall transfer function for setting *another* hearing aid. The only location where such a teaching is present is Applicants' disclosure.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees which may be required, or to credit any overpayment to account No. 501519.

Submitted by,

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